CLAIMS

1. (CURRENTLY AMENDED) A system permitting the imbedding of images from other sources within images captured by a viewing unit (10, 10') in motion, by transmitting and analyzing the positional coordinates of that unit(10, 10') during the acquisition of a sequence of video images while the unit (10,10') is moving. This activity involves three steps:

- A preliminary step consisting of attaching the viewing unit (10, 10') to the first subsystem (11, 11') which contains an inertial sensing unit delivering data signals representing the spatial coordinates and the instantaneous inclination of that unit (10,10') with respect to a reference point;

- A first step involving the acquisition, in real time, of said data signals during the movement of the viewing unit (10, 10') along a trajectory (*t*) and their transmission to a second subsystem (12, 2) which includes equipment for processing these data (4) using a stored software program;

- A second step consisting of processing these data, either in real time and/or deferred for later analysis, so as to determine the positional coordinates.

2. (CURRENTLY AMENDED) The reference point (*XYZ*) is an orthonormal trihedron and the coordinates represent the position of the viewing unit (10, 10') along the trajectory (*t*) in relation to the axes of the trihedron of reference (*XYZ*) and the inclination data represents the angles of azimuth, elevation and roll around the axis

of the unit (10, 10'), which intersects the center (C) of the focal plane (FP) of the acquired images (I).

3. (CURRENTLY AMENDED) There is a procedure wherein, according to claim 1, during a supplementary preliminary step, the inertial sensing unit (52) is initialized and standardized with respect to a reference point of origin.

4. (CURRENTLY AMENDED) There is another process involving the application of error corrections to the positional data streams delivered by the inertial sensing unit, by applying an image analysis procedure the software for which is included in the data processing unit.

5. (CURRENTLY AMENDED) There is also a process for integrating the focal planes *(FP)* of images *(I)* obtained using the viewing unit (10, 10') with the focal planes of images from other sources whose spatial coordinates are already known, by acquiring data identifying the focal length used by the viewing unit (10, 10') and by capturing, in real time, data signals representing the spatial coordinates and the instantaneous inclination of the unit (10, 10') with respect to the reference point *(XYZ)*, which permits determination of the corresponding coordinates of the focal planes *(FP)* of all the images *(I)* within the video sequence. The coordinates of the focal plane *(FP)* of each image *(I)* being:

- The inclination of said focal plane *(FP)* in space with respect to said reference *(XYZ)*, represented by the angles of elevation, azimuth and roll; and

- The position of the center *(C)* of said plane *(FP)* of the image *(I)* with respect to said reference point *(XYZ)*.

6. (CURRENTLY AMENDED) Furthermore, and according to claim 1, a process exists for navigating within a three-

dimensional universe (59) involving a preexistent three-dimensional decor. This process consists of the supplementary steps of acquisition and transmission to the second subsystem (2, 12), in real time, of data representing the spatial coordinates and the instantaneous inclination of the viewing unit (10, 10') with respect to the reference point (*XYZ*), as well as the focal length used, and the images captured by unit (10, 10'). The data signals and the images are then processed using software for three dimensional reconstitution, in a manner so as to visualize, in real time, an outline of the framing of the unit (10, 10') within a preexisting three-dimensional virtual decor.

7. (CURRENTLY AMENDED) There is also a system for the transmission and processing of data representing the position in space of a viewing unit (10, 10') capturing a sequence of video images while moving in space along a trajectory determined with respect to a reference in order to implement the processes, according to claims 1 to 4, involving a first subsystem (11, 11') attached to a viewing unit (10, 10'). The first subsystem (11, 11') comprises an inertial sensing unit delivering data signals representing the spatial coordinates and instantaneous inclination of the viewing unit (10, 10') with respect to a reference point (*XYZ*). In addition, the system (1, 1') includes a second subsystem (2, 12) provided with the ability to process these data according to a stored software program (4) and possessing a means for supplying electrical energy (400-401) to all or part of the system (1, 1'). Finally, it is envisaged that the system will include connecting devices (112, 112') for transmitting said signals from the first (11, 11') to the second subsystem (2, 12).

8. (ORIGINAL) With respect to claim 7, the viewing device (10, 10') is a video camera.

9. (ORIGINAL) In claims 7 or 8, the inertial sensing unit includes at least one gyrometer and one accelerometer with three distinct, non-coplanar axes.

10. (CURRENTLY AMENDED)With respect to any of claims 7 to 9, in order to improve the determination of spatial coordinates of said viewing device (10, 10'), to improve the synchronization between said acquired data and the images (*I*) obtained, and/or to apply corrections to said acquired data, the system will include at least one of the following components:

- A tri-flux rotary magnetometer;
- Two inclinometers, orthogonal with respect to each other;
- A satellite localization device of the "GPS" type;
- An electronic localization device, using either electromagnetic or electrostatic fields;
- A magnetometer of one or several fluxes, either static or dynamic;
- An odometer;
- A temperature sensor;
- A precision quartz timer;
- An auxiliary video camera, attached to said first subsystem, and/or
- A microphone (23).